

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number  
**WO 2004/113374 A3**

(51) International Patent Classification<sup>7</sup>: **C07K 14/295**,  
A61K 39/118

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(21) International Application Number:  
PCT/EP2004/006460

(22) International Filing Date: 16 June 2004 (16.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
03450148.6 17 June 2003 (17.06.2003) EP

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

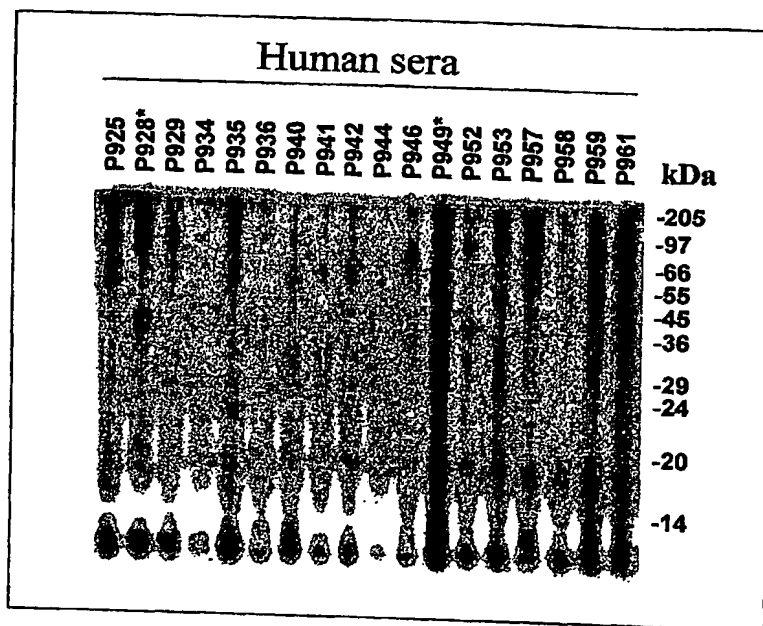
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

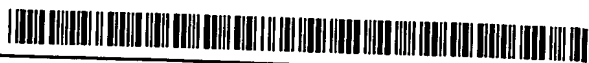
[Continued on next page]

(54) Title: **CHLAMYDIA PNEUMONIAE ANTIGENS**



(57) Abstract: The present invention discloses isolated nucleic acid molecules encoding a hyperimmune serum reactive antigen or a fragment thereof as well as hyperimmune serum reactive antigens or fragments thereof from *C. pneumoniae*, methods for isolating such antigens and specific uses thereof.

WO 2004/113374 A3



**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**(88) Date of publication of the international search report:**  
14 July 2005

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/006460

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 C07K14/295 A61K39/118

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)  
EPO-Internal, BIOSIS, EMBASE, CHEM ABS Data, Sequence Search, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WOLF K ET AL: "Chlamydia pneumoniae major outer membrane protein is a surface-exposed antigen that elicits antibodies primarily directed against conformation-dependent determinants" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 69, no. 5, May 2001 (2001-05), pages 3082-3091, XP002227172 ISSN: 0019-9567 the whole document	1,2, 4-10, 12-26, 28-35
X	WO 02/20047 A (SWANBORG ROBERT H ; WHITTUM HUDSON JUDITH A (US); HUDSON ALAN P (US);) 14 March 2002 (2002-03-14)  page 7 - page 8	1,2, 4-10, 12-26, 28-35

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the International filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the International filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

16 November 2004

Date of mailing of the International search report

03 05 2005

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/006460

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL "Chlamydia pneumoniae section 49 of 103 of complete genome" XP002305289 retrieved from EBI accession no. AE001633 abstract	1,2,4-7
P,X	----- HENICS T ET AL: "Small-fragment genomic libraries for the display of putative epitopes from clinically significant pathogens" BIOTECHNIQUES, EATON PUBLISHING, NATICK, US, vol. 35, no. 1, July 2003 (2003-07), pages 196-200,202,20, XP002293668 ISSN: 0736-6205 the whole document	1,2, 4-10, 12-26, 28-35
A	----- PEREZ MELGOZA M ET AL: "ISOLATION AND CHARACTERIZATION OF A GENE ENCODING A CHLAMYDIA PNEUMONIAE 76-KILODALTON PROTEIN CONTAINING A SPECIES-SPECIFIC EPITOPE" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, US, vol. 62, no. 3, 1 March 1994 (1994-03-01), pages 880-886, XP000198425 ISSN: 0019-9567 the whole document	1,2, 4-10, 12-26, 28-35
A	----- ESSIG ANDREAS ET AL: "Analysis of the humoral immune response to Chlamydia pneumoniae by immunoblotting and immunoprecipitation" CLINICAL AND DIAGNOSTIC LABORATORY IMMUNOLOGY, vol. 6, no. 6, November 1999 (1999-11), pages 819-825, XP002304468 ISSN: 1071-412X page 823, column 1, paragraph 4 page 819	1,2, 4-10, 12-26, 28-35
A	----- KLEIN MARCUS ET AL: "Detection of Chlamydia pneumoniae-specific antibodies binding to the VD2 and VD3 regions of the major outer membrane protein." JOURNAL OF CLINICAL MICROBIOLOGY. MAY 2003, vol. 41, no. 5, May 2003 (2003-05), pages 1957-1962, XP002304467 ISSN: 0095-1137 figure 4 page 1958, column 1, line 3 - line 11 ----- -/--	1,2, 4-10, 12-26, 28-35

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/006460

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>MONTIGIANI S ET AL: "GENOMIC APPROACH FOR ANALYSIS OF SURFACE PROTEINS IN CHLAMYDIA PNEUMONIAE"</p> <p>INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 70, no. 1, January 2002 (2002-01), pages 368-379, XP009032240</p> <p>ISSN: 0019-9567</p> <p>table 2</p> <p>page 373, column 2, paragraph 4 - page 374, column 1, paragraph 1</p> <p>-----</p>	<p>1,2,</p> <p>4-10,</p> <p>12-26,</p> <p>28-35</p>

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2004/006460

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
claims partially 1, 2, 4-10, 12-35

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## Continuation of Box II.2

Present claim 27 relates to a product defined by reference to a desirable characteristic or property, namely being an antagonist binding the antigen.

The claim covers all products having this characteristic or property, whereas the application provides no support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search for this claim is impossible.

Present claims 1c-e and 3c-e relate to an extremely large number of possible products. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the products claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been/ will be carried out for those parts of the claims which appear to be supported and disclosed, namely claims 1a-b and 3a-b.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1: Claims partially 1,2,4-10,12-35

Nucleic acid molecule Seq ID No:31 and corresponding amino acid sequence Seq ID No: 91, fragments thereof, vector, host cell comprising it, process for expresssion, first and second medical use, antibody, method for producing antibody, method for identification of antagonist and processes for in vitro diagnosis.

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Inventions 2-107: Claims 3,11 and partially 1,2,4-10,12-35

Nucleic acid molecules and corresponding amino acid sequences, fragments thereof, vector, host cell comprising it, process for expresssion, first and second medical use, antibody, method for producing antibody, method for identification of antagonist and processes for in vitro diagnosis.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/006460

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 0220047	A	14-03-2002	AU	8876401 A	22-03-2002
			WO	0220047 A2	14-03-2002
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